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EXAMINER

JETTON, CHRISTOPHER M

ART UNIT

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3748

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/599,282	Applicant(s) WEGENER ET AL.	
	Examiner CHRISTOPHER JETTON	Art Unit 3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 September 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 June 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

Receipt is acknowledged of applicant's amendments filed 9/15/2009. No claims have been cancelled. Claims 1-21 are pending and an action on the merits is as follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by **Danihel (US 4,598,547)**.

Regarding claims 1-5, Danihel (Fig 1) discloses a wave energy harvester (10) comprising: an at least partially submersed amplifier element (75), wherein the element is functionally coupled (16) to a generator such that at least a portion of vertical movement of the element actuates the generator (Col 4 Lines 44-47); wherein the amplifier element has a shape (Col 7 Line 52) and is arranged on the harvester such that the amplifier element (75) is effective to translate forward velocity of water of a cresting wave relative to the element into an additional upward force of the entire wave energy harvester as compared to an upward force without the amplifier element ; and

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wherein the amplifier element is configured such that lift generated by forward motion of the wave increases drag on the harvester. The shape of the amplifier element has a hydrofoil shape or a hull shape (75). The generator comprises an electric generator (Col 4 Lines 44-47). A structure (12) that retains the harvester in a laterally fixed position relative to a sea floor, and that allows vertical movement of the amplifier element relative to the sea floor (Col 2 Lines 2-10).

Regarding claims 6-10, Danihel (Fig 1) discloses a wave energy harvester (10) comprising a hydrofoil element (75) that is arranged on the harvester such that the hydrofoil element produces a supplementary bi-directional vertical force from a horizontal motion of water of a wave relative to a harvester, wherein the bi-directional force is directed upwards as the wave approaches a peak and directed downwards as the wave approaches a trough. The hydrofoil element (75) is completely submersed and is coupled to a buoyant element (23) that is at least partially submersed (Col 7 Lines 52-54). A generator is actuated using at least part of the bi-directional force (Col 4 Lines 44-47). A structure (12) that retains the harvester in a fixed relationship to a sea floor, and that further restricts movement of the hydrofoil element to substantially vertical movement (Col 2 Lines 2-10).

Regarding claims 11-14, Danihel discloses a floating device comprising a hydrofoil (Fig 1, 75) that is positioned on the device to amplify and optionally reduce a buoyant force of a wave passing the device; wherein the hydrofoil is positioned such that lift generated by a forward motion of the wave increases drag on the device in direction of the wave travel. A frame (Fig 1, 64) to which the hydrofoil is coupled and

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that is configured to allow change of a pitch angle of the hydrofoil relative to a plane normal to a direction of the wave to thereby effect at least one of reduction and amplification of the buoyant force. A structure (12) that retains the device in a fixed relationship to a sea floor, and that further restricts movement of the hydrofoil to substantially vertical movement (Col 2 Lines 2-10). A generator that is actuated at least in part by the substantially vertical movement (Col 4 Lines 44-47).

Regarding claims 15 and 16, Danihel discloses a wave energy harvester (Fig 1, 10) comprising a neutral buoyancy body (Fig 1, 23) coupled to an amplifier element (Fig 1, 64) that is arranged such that the element and the body is additionally raised by forward water motion of a wave moving past the harvester as compared to a harvester without the amplified element, and wherein the amplifier element is configured such that lift generated by the forward motion of the wave increases drag on the harvester. The amplifier element comprises a hydrofoil (75).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Danihel (US 4,598,547) in view Heck (US 4,447,740)**.

Regarding claim 17, Danihel fails to disclose energy is extracted using a turbine that is coupled to the neutral buoyancy body.

However, Heck teaches a wave powered electrical generator (10) provides a buoyant float (12) for riding waves in a bobbing fashion. Attached to float (12) is outer shaft (20) depending downwardly from float (12). Inner rotatable drive shaft (25) is rotatably mounted within outer shaft (20) and transmit rotational energy to alternator or generator (60) responsive to wave action on turbine (30) (Fig 1 Col 3 Lines 49-59).

It would have been obvious to one of ordinary skill in the art to modify Danihel's invention with turbine taught by Heck since the turbine would have a more direct connection for power production.

Claims 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Danihel (US 4,598,547) in view Houser (US 5,411,377)**.

Regarding claims 18, 19, and 21, Danihel fails to disclose the wave energy harvester has neutral buoyancy and becomes submerged when a storm churns a water surface.

However, Houser teaches for protection of the system in extremely high seas and heavy storms a method is provided for submerging the entire pump system. This is provided by including a solenoid valve (82) of toroidal buoyancy vessel (34). During

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high seas solenoid valve (82) is opened allowing buoyancy vessel (34) to be flooded submerging the entire pump system for protecting against damage (Col 5 Lines 56-62).

It would have been obvious to one of ordinary skill in the art to modify Danihel's invention with the submerging system taught by Houser since doing so would prevent damage to the system when the surrounding environment became dangerous.

Regarding claim 20, Danihel discloses a hydrofoil (Fig 1, 75).

Response to Arguments

Applicant's arguments filed 9/15/2009 have been fully considered but they are not persuasive.

Claims 1-5

The new citations of Danihel provided in the rejection of claim 1 are no longer committed to a propulsion system of a floating vessel. Rather, the citations refer to "a device for converting wave energy to mechanical motion" with the use of a float that rides "upon the undulating surface of a body of water" and a hydrofoil system connected below the float (Col 7 Lines 39-60). Applicants' claim language describing the function of the hydrofoil does not further limit the claim since these limitations are inherent to a hydrofoil in any situation a moving medium is present. When water moves across the hydrofoil lift will be created and this will supplement the buoyant motion of the float located on the surface. Also, it is without question that adding a hydrofoil in the manner

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disclosed by the Applicants will produce an increased drag on a substantially stationary harvester since the hydrofoil system increases the cross-sectional area exposed to the motion of the passing water. Danihel's wave energy transducer only experiences a reduction in drag when the system is "employed as a power generator in a vessel propulsion system" and the entire system is moving through the water. When the wave energy transducer is retained in one location, as described by Danihel (Col 2 Lines 2-10), the system as claimed is identical to the limitations in claim 1 of the present invention.

Claims 6-10

As discussed above in the response to arguments to claims 1-5, Danihel's claimed invention is identical to Applicants' current invention. Any forward motion acting on the hydrofoil from a passing wave would create an additional upward force and vice versa. Again, the forward and backward forces are only present in Danihel's invention when the wave energy transducer produces power to be used in propelling a vessel. When no horizontal motion is present, other than the slight motion from the waves, the two systems perform the same operations.

Claims 11-14

The arrangement presented by the current disclosure is only inconsistent with the propelled vehicle described by Danihel. It is not inconsistent with what is claimed by Danihel which describes a float following the surface of the water with a hydrofoil

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positioned below. Danihel also suggests the device can be fixed to a permanent structure. In this regard, Danihel completely anticipates the current claims.

Claims 15-16

Since the claim language of claims 15 and 16 disclose no further limitations from the rejected claims above the response to arguments presented for claims 1-14 will suffice. Danihel completely anticipates the current claims.

Claim 17

The patents of Danihel and Heck both disclose wave energy converters which comprise of floats following the surface of the waves. In the combination of Danihel and Heck, Heck is not relied on to teach an amplifier element since Danihel already discloses this feature. Heck is merely presented to show the current state of the art regarding the use of a turbine that operates based on the vertical motion communicated by the float as a result of wave motion. The combination of these two references would require only ordinary skill in the art since all of the claimed elements were known with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements. Furthermore, the pre-existing elements (the turbine of Heck and the wave energy converter of Danihel) in combination do no more than they would in separate operation, and one having ordinary skill in the art could have combined the elements as claimed by known methods with no change in their respective functions and the combination yielded nothing more than predictable results.

Claims 18-20

Houser's invention has the ability to adjust its buoyancy at any point during its operation. The motivation provided by Houser (Col 5 Lines 56-62) is the same as that of the Applicants' and would be applicable to buoys described by Danihel (Col 2 Lines 11-13). The current invention performs the same functions as that of the prior art except Applicants require their invention to be neutrally buoyant during normal operation. Since the current invention and prior art share the same motivation and result, and the current invention offers no technological advances over the prior art, it seems it would be an obvious matter of design choice to have a permanently neutrally buoyant device. Finally, the mere existence of differences between the prior art and an invention does not establish the invention's nonobviousness.

In addition, while the current invention is fully anticipated or held obvious by the prior art above, it should be noted that the device as claimed is merely a combination of known elements that perform their same functions in combination as they do separately. The buoyant or neutrally buoyant harvester follows the motion of the waves as is known in the art and is coupled with a hydrofoil to amplify this vertical motion. The science behind a hydrofoil is well understood and it would be obvious to one having ordinary skill to simply combine a hydrofoil with any device experiencing the relative translational motion of a medium such as air or water since the resulting lift (or other vertical force) would be an expected and predictable result. Those in the art are capable of

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recognizing the effect of a hydrofoil and that the application of such a device to other known technical areas that are ready for improvement would only yield results considered to be obvious.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER JETTON whose telephone number is (571)270-7108. The examiner can normally be reached on Monday through Friday, 7:00AM to 5:00PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Denion can be reached on (571)272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas E. Denion/
Supervisory Patent Examiner, Art Unit 3748

/CHRISTOPHER JETTON/
Examiner, Art Unit 3748